

ABSTRACT OF THE DISCLOSURE

A novel class of semiconductor lasers, or "tilted cavity lasers" includes at least one active element with an active region generating an optical gain by injection of a current and mirrors. The active element is placed into a cavity. The cavity is designed such that the optical path of the resonant optical mode is tilted with respect to both the vertical direction and the lateral plane. Thus, the feedback both in the vertical and in the lateral direction is provided for the resonant optical mode. Depending on the particular embodiment, the laser operates as both a surface emitting laser and an edge-emitting laser. Employing a tilted optical mode allows the use of substantially fewer layers in the bottom and the top interference reflectors than in conventional lasers. This preserves the necessary high reflection coefficients. Also, a wavelength-stabilized laser is realized for edge-emitters. The wavelength stabilization is due to the difference in the dispersion laws for the tilted optical modes in layers having different refractive indices.

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